

New regime for strengthening earthquake-prone buildings – Technical Note

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When legislation was passed in 2016 to implement the current system for strengthening earthquake-prone buildings, the costs were estimated at 46 times the benefits on a present value basis. Owners and councils have been struggling with the regime ever since.

A Select Committee is now considering a Bill that will replace the existing regime with a new pared-down system that will narrow the set of earthquake-prone buildings significantly, and reduce strengthening requirements for many of the buildings that will still need remediation.

While it is undoubtedly an improvement over the current regime, the analysis does not establish that the benefits of the new regime outweigh its costs.

The second major problem with the current regime is that building owners were required to meet remediation costs that have proven uneconomic or unaffordable for many. Failure to strengthen has meant failure to meet the primary objective of improved safety. The new regime does nothing to address this problem for the private owners who will still be required to undertake significant remediation.

Without assurances that the benefits exceed the costs, and that the required strengthening will actually be carried out, there is a high risk that the new regime will repeat the mistakes made in 2016.

The numbers raise a lot of questions

The numbers used now, and in the past, to analyse the costs and benefits of earthquake strengthening are difficult to follow, to say the least. A variety of methodologies have been used, making it hard to compare the results, draw conclusions, or challenge government decisions. That is a problem in itself.

In 2025, Beca carried out extensive modelling for MBIE to assess the costs and benefits of different options to strengthen earthquake-prone buildings. The first report was produced in May 2025, and the second in August 2025 (see links below). The results of the August report have fed into papers for Cabinet and informed the decision to introduce a new pared-down regime, referred to as Option 3.1.

The modelling uses two approaches -

- The ApoE (annual probability of exceedance) approach produces benefit-cost ratios that are extremely high. This is because the method doesn't apply the probabilities of a quake of each strength, and nor is there any discounting over time. As a result, these figures are only useful for comparing options and not for establishing that an option should actually be chosen/implemented.

- Traditional Cost Benefit Analysis incorporates different sizes of possible earthquakes, using probabilities, and applies discounting over time.

The recommendation to implement the new regime, Option 3.1, is supported by a set of traditional benefit-cost ratios set out in Annex 1 of the 2025 Regulatory Impact Statement. For ease of reference, the key table in Annex 1 is reproduced below.

Table 1: Reproduced from Annex 1 of 2025 Regulatory Impact Statement

Benefit cost ratio of preferred option and status quo by location

	Status Quo	Option 3.1
Auckland	0.3	N/A
Waikato	0.9	1.5
Bay of Plenty	1.8	2.6
Gisborne	2.3	3.6
Hawke's Bay	4.2	9.9
Taranaki	0.8	0.7
Manawatu-Whanganui	3.0	7.5
Wellington	3.2	4.6
Tasman	3.0	15.4
Nelson	3.2	8.2
Marlborough	3.1	13.4
West Coast	1.9	3.2
Canterbury	2.0	2.5
Otago	1.4	1.9
Southland	2.3	6.8

Source: Regulatory Impact Statement, MBIE 2025

For comparison, Table 2 below shows the corresponding figure for the Status Quo calculated in 2012 by Martin Jenkins.

Table 2: National figure from 2012 benefit cost analysis

Traditional BCR	0.02
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Source: Indicative CBA, Martin Jenkins 2012

The figures in MBIE's Annex 1 clearly suggest that benefits exceed costs in most places for both the current and the new regime. This raises a red flag because it is in stark contrast to the assessment of costs versus benefits done in 2012, which produced a BCR of 0.02.

Martin Jenkins summed-up their results as follows -

"In all cases, even with extreme sensitivity scenarios, costs substantially exceed benefits. This is mainly because large earthquakes that cause significant damage are very rare, and smaller more common earthquakes don't cause very much damage."

The following tables look behind the benefit-cost ratios in Annex 1 in order to highlight some comparisons that are hard to explain. The equivalent tables for Otago are provided in the Attachment. Note the critical BCR figures in blue.

Table 3: Costs and benefits of the current regime (Status Quo)

Traditional Cost-benefit analysis (from Table 34) \$b		ApoE for a 1:500 quake (from Tables 33 & 17) \$b	
<i>Wellington</i>		<i>Wellington</i>	<i>National</i>
PV Benefits	40.122 ¹	Benefits	181.800
PV Costs	12.538 ¹	Costs	10.900
Net PV	27.584		
BCR	3.2	BCR	19

Source: Beca August 2025

Table 4: Costs and benefits of new regime (Option 3.1)

Traditional Cost-benefit analysis (from Table 34) \$b		ApoE for a 1:500 quake (from Tables 33 & 17) \$b	
<i>Wellington</i>		<i>Wellington</i>	<i>National</i>
PV Benefits	25.234 ¹	Benefits	75.800
PV Costs	5.486 ¹	Costs	2.500
Net PV	19.748		
BCR	4.6	BCR	30

Source: Beca August 2025

1. These numbers don't appear in the report. They have been calculated using the report's NPV and BCR figures as follows: $PVC = NPV / (BCR - 1)$ and $PVB = BCR \times PVC$. Note that, because MBIE has rounded the BCRs to one decimal place, the derived benefit and cost figures above are subject to rounding error. However, this does not alter the conclusions.

The Status Quo – the 2012 and 2025 analyses compared

The current regime was assessed in 2012 by Martin Jenkins, and then in August 2025 by Beca. The two exercises produced starkly different results:

- In 2012, the present value of benefits was \$37 million for the whole country; in 2025 it is over \$40.1 billion for Wellington alone (see Table 3)
- In 2012, the present value of costs was \$1.7 billion for the whole country; in 2025 it is over \$12.5 billion for Wellington alone (see Table 3).

It is difficult to see how the assessment of the current regime could have changed so dramatically.

The Status Quo versus Option 3.1 – 2025

Tables 3 and 4 are both derived from the 2025 analysis: they show figures described as traditional cost benefit analysis alongside figures produced on an ApoE basis. The ApoE figures on the right-hand side of the tables at least appear to be internally consistent, for example, Wellington's share of national benefits and costs look proportionate.

However, when these are converted to the present value figures on the left, they no longer make sense:

- how can the present value of the costs of the Status Quo be over \$12.5 billion for Wellington alone when we've been told the cost for the whole country is \$10.9 billion?
- how can the present value of costs for Option 3.1 be over \$5.4 billion for Wellington alone when the government's commentary puts the costs for the whole country at \$2.7 billion?
- how can a cost for Wellington of \$0.9 billion on an ApoE basis become more than \$5.4 billion on a present value basis? Surely the number should drop rather than scale up by a factor of 6?

The present value cost figures look far too high and add up to far more than the national cost of the regime.

Turning to the benefit side, to move from ApoE figures to present value figures, the benefits of strengthening have to be multiplied by earthquake probabilities and discounted over time. The present value of benefits should therefore be far lower than the ApoE figures. For Wellington, however, the benefit figures in red are very similar on both sides of each table, despite the different methodologies.

Given the very significant question marks over the Annex 1 benefit-cost ratios, they should not be accepted at face value.

Note also that the 2025 Regulatory Impact Statement stops short of claiming that the benefits of Option 3.1 outweigh the costs. Para 40 of the summary asks the direct question *"Will the benefits of the Minister's preferred option outweigh the costs?"*. MBIE's answer is - *"Option 3.1 presents higher benefit-cost ratios than the status quo across most New Zealand regions (refer Annex One)."*

While that statement is no doubt true, being better than the status quo is an extremely low bar. The answer that Cabinet should be looking for here is "Yes", together with figures stating my how much, but Cabinet doesn't get that.

Before agreeing to implement Option 3.1, Cabinet should have had an assurance that the new level of strengthening would be a good investment, with benefits that outweigh the costs.

MBIE's simple points system is inadequate

When MBIE compares the options in the 2025 Regulatory Impact Statement (Table 10), it uses a simple points system that appears to be set up to reinforce the pre-determined solution, ie Option 3.1.

The points are not a valid way of comparing the options because, for example, 2 points are assigned for a \$5b reduction in costs to building owners and also for reducing administration costs, which are not of a comparable order of magnitude.

In another example of the points given by MBIE, the increase in the ease of administration for Option 3.1 wipes out the increased risk to life. Relative to the Status Quo, the scores given to Option 3.1 are -3 for increased risk to life and +3 for easier administration. Given that improving life safety is stated to be the primary objective of the regime, it is hard to see how easier administration can possibly carry as much weight as 30% more expected deaths and injuries.

MBIE's points system adds apples to oranges and gets nonsense.

In the body of the Regulatory Impact Statement, MBIE notes that Option 3.1 scores "best among the regulatory options" on reducing costs to owners, ease of administration, and proportionality, but worst among these options on the primary objective of saving lives. However, in the summary section, the point about scoring worst on life safety has been dropped. Anyone reading the summary only, would be left with a misleading impression of the option being proposed.

Ensuring the strengthening will happen

Building owners and council administrators have struggled to implement the current system. Some owners have incurred very high and disproportionate costs strengthening their buildings, while others have sustained large losses by selling buildings at heavily discounted prices. Some are stuck in limbo, unable to afford to do either.

Many New Zealanders will be aware of buildings that have been left vacant for extended periods including, for example, the Town Hall, the Central Library, and the Gordon Wilson Flats in Wellington.

Where earthquake-prone buildings are owned by central or local government, the very high costs of strengthening are met by taxpayers and ratepayers respectively, so at least the costs are shared. However, for privately-owned buildings, the owners have to fund the required strengthening themselves – alternatively, they can wait for the local council to send in the demolition crew and then be sent the bill.

Following a review last year, MBIE acknowledged the futility of the current regime -

"In practice, however, the retrofit costs under the current Earthquake-Prone Building system are often prohibitively high, meaning many building owners are unable to carry out remediation work. As a result, the intended life safety benefits are not being realised in most cases."

MBIE also advised Cabinet that:

- rules for heritage buildings posed an additional barrier to remediation, noting that a targeted or full retrofit would cost twice as much as for a non-heritage building
- apartment owners face additional barriers because their complex ownership structures make coordination and financing more difficult
- requiring private owners to remediate buildings without any financial assistance was contrary to international best practice.

Despite these problems, MBIE's advice didn't even seriously consider providing financial assistance or buying-out privately-owned buildings that were uneconomic to strengthen.

Conclusion

Ten years ago, Parliament, with the notable exception of David Seymour, disregarded the extremely poor benefit-cost ratios established at that time and voted for a very flawed regime to strengthen earthquake-prone buildings.

By removing Auckland and many other buildings from the current regime, the new regime is certainly an improvement. But that is not enough. Before implementing a new regime, it needs to be established that:

- the new regime is a good investment. Based on the numbers and commentary to date, and the analysis provided above, this has not been established
- it can be implemented successfully, ie. that the remediation required can actually be achieved. Based on experience to date, this won't happen without significant financial support to private owners.

Documents referred to above

September 2012 Martin Jenkins Indicative CBA –

<https://www.mbie.govt.nz/dmsdocument/74-cost-benefit-analysis-earthquake-prone-building-review-pdf>

August 2025 Regulatory Impact Statement -

<https://www.mbie.govt.nz/dmsdocument/31202-regulatory-impact-statement-effectively-managing-seismic-risk-in-existing-buildings-proactiverelease-pdf>

May 2025 Beca analysis –

<https://www.mbie.govt.nz/dmsdocument/31304-economic-analysis-of-new-zealands-earthquake-prone-buildings-proactiverelease-pdf#page41>

August 2025 Beca analysis for RIS, including Option 3.1 -

<https://www.mbie.govt.nz/dmsdocument/31306-cost-benefit-analysis-results-for-revised-seismic-risk-mitigation-approach-for-new-zealands-earthquake-prone-buildings-proactiverelease-pdf>

Attachment: Tables for Otago

Costs and benefits of the current regime (Status Quo)

Traditional cost-benefit analysis (from Table 34) \$b		ApoE for a 1:500 quake (from Tables 28 & 17) \$b		
	<i>Otago</i>		<i>Otago</i>	<i>National</i>
PV Benefits	3.287 ¹	Benefits	7.900	181.800
PV Costs	2.348 ¹	Costs	0.430	10.900
Net PV	0.939			
BCR	1.4	BCR	18	17

Source: Beca August 2025

Costs and benefits of new regime (Option 3.1)

Traditional cost-benefit analysis (from Table 34) \$b		ApoE for a 1:500 quake (from Tables 28 & 17) \$b		
	<i>Otago</i>		<i>Otago</i>	<i>National</i>
PV Benefits	2.941 ¹	Benefits	6.600	75.800
PV Costs	1.548 ¹	Costs	0.260	2.500
Net PV	1.393			
BCR	1.9	BCR	25	30

Source: Beca August 2025

1. These numbers don't appear in the report. They have been calculated using the report's NPV and BCR figures as follows: $PVC = NPV / (BCR - 1)$ and $PVB = BCR \times PVC$. Note that, because MBIE has rounded the BCRs to one decimal place, the derived benefit and cost figures above are subject to rounding error. However, this does not alter the conclusions.